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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is also included. (AG)

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TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

WAITRESS (hotel & rest.) 2-27.12

B-447 S-179

TM 001 610

U. S. Employment Service in
Cooperation with
Michigan State Employment Service

U. S. DEPARTMENT OF LABOR
Bureau of Employment Security
Washington 25, D. C.

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GATB #2313
December 1959

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY FOR WAITRESS 2-27.12

B-447

Summary

The General Aptitude Test Battery, B-1002B, was administered in August of 1959 to a sample of 70 employed female Waitresses, 2-27.12, in Muskegon, Michigan. Ten were eliminated, leaving a total sample of 60 workers. The employees were members of the Waitresses and Bartenders Union, Local #411, and were employed by seven restaurants in the greater Muskegon area.

The criterion consisted of supervisory ratings based on a descriptive rating scale. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data, and their combined selective efficiency, Aptitudes N-Numerical, and M-Manual Dexterity were selected for inclusion in the test norms.

GATB Norms for Waitress 2-27.12 - B-447

Table I shows, for B-1001 and B-1002, the minimum acceptable score for each aptitude included in the test norms for Waitress 2-27.12.

TABLE I

Minimum Acceptable Scores on B-1001 and B-1002 for B-447

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
N	CB-1-D CB-1-I	90	N	Part 2 Part 6	85
M	CB-1-M CB-1-N	90	M	Part 9 Part10	85

Effectiveness of Norms

The data in Table V indicate that 11 of the 20 poor workers, or 55 percent of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 55 percent of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 34 of the 43 workers who made qualifying test scores, or 79 percent, were good workers.

I. Problem

This study was conducted to determine the best combinations of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery, for the occupation of Waitress 2-27.12.

II. Sample

A. During the period August 24 to August 26, 1959, the General Aptitude Test Battery, B-1002B, was administered to a sample of 70 Waitresses, 2-27.12, in Muskegon, Michigan. The workers were employed in 8 of the greater Muskegon area restaurants and were members of the Bartenders and Waitresses Union, Local #411. Of the 70 workers tested, 10 were eliminated from the sample: 8, the total number tested from the Black Angus Restaurant, due to incomplete criterion data; and 2 from the Doo Drop Inn because of insufficient experience (less than 6 months). Therefore, the final sample consisted of 60 women. The names of the restaurants, the total number of waitresses employed, and the number of employees included in the final sample for each establishment are shown below.

Restaurant	Number Employed	Number in Sample
Bill Sterns	6	1
Cherneys	4	2
Club 87	4	4
Doo Drop Inn	35	20
Drelles	16	13
Howard Johnson	15	14
Lakos	15	6
	Total	60

The workers for this sample were selected on a voluntary basis. All employees of the above restaurants were requested to cooperate in the study by the restaurant owners, union officials, and the union committee members who are jointly undertaking a Waitress Training Program. These restaurants that are cooperating with the union in the School for Waitresses represent the larger dining establishments in the Muskegon area and, with the exception of Howard Johnson, serve liquor. The development of an aptitude test battery was requested for use in the screening of candidates for Waitress training. No tests have been used in the selection of the present employees.

The requirements for employment as a waitress vary with the individual restaurant owner; however, all will accept workers with no previous experience. On-the-job training is furnished, and the owners agreed that 6 months was the specific training time required to be proficient in the occupation.

The desired age and educational requirements for each restaurant are listed below:

Restaurant	Age	Education
Bill Sterns	25-40	Open
Cherneys	21-50	10th grade
Club 87	18-35	8th grade
Doo Drop Inn	20-40	8th grade
Drelles	30-35	10th grade
Howard Johnson	17-50	10th grade
Lakos	21-50	8th grade

B. Table II shows the means, standard deviations, ranges, and Pearson product-moment correlations with the criterion for age, education, and experience.

TABLE II

Means (M), Standard Deviations (σ), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

N = 60

	M	σ	Range	r
Age (years)	33.8	8.8	17-56	.129
Education (years)	10.8	1.6	7-14	-.074
Experience (months)	108.7	88.0	6-480	.065

**Significant at the .01 level
*Significant at the .05 level

There are no significant correlations with the criterion for age, education, or experience. The data in Table II indicate that this sample is suitable for test development purposes with respect to age, education and experience.

III. Job Description

Job Title: Waitress 2-27.12

Job Summary: Sets tables, takes orders and serves meals according to a prescribed pattern. Studies menu to comprehend contents and to determine specials. Greets customer and assists in seating patrons. Takes orders for and serves drinks and food. Makes suggestions as to selections to patrons, calculates charges, receives payment or directs customer to cashier. Cleans and arranges eating and serving areas after customer has finished eating.

Work Performed: Prepares a group of tables as assigned by manager. Sets table with silver and dishes, inspects tables to insure that all utensils, chairs, and surrounding area are clean and orderly. Studies menu to comprehend contents. Discusses menu with manager or cook to determine "specials" or any changes. Greets patrons with menu, serves ice water, sometimes provides bread, butter, and relish tray. Refills water glasses

throughout meal. Takes orders for drinks before meals. Orders drinks from bar. Keeps a record of drinks. Serves drinks. Takes orders for food. Makes suggestion if indicated by patron. Records order in a prescribed manner. Transmits order to cook in written or oral form. Serves the salads, soups, and juice as ordered. Sometimes ladles soup and prepares salads. Keeps close contact with the kitchen to know when main course is ready to serve. Transports food from kitchen by hand or tray. Serves main course according to the rules of etiquette. Responds to the needs of the patron while he is eating, and may engage in general conversation. Serves coffee and dessert after meal if ordered. Calculates the amount of bill, adding taxes as prescribed. Presents check to patron, directs patron to cashier, or collects payment and returns change to patron. Keeps table supplies on hand in correct amounts. Cleans table, buffets, serving counters, and coffee makers or directs the busboy to do so.

IV. Experimental Battery

All the tests of the GATB, B-1002B, were administered to the sample group.

V. Criterion

The criterion consisted of supervisory ratings based on a revision of the Descriptive Rating Scale SP-21 developed by the Bureau of Employment Security. The rating scale consisted of 11 items covering different aspects of job performance which were suggested by the restaurant owners as relevant to the occupation.

Five alternatives for each item were offered. Weights of one through five, indicating the degree of job proficiency attained, were assigned to each alternative.

The restaurant owners, who were thoroughly familiar with the work of each employee, prepared ratings and reratings for each worker with an interval of four to six weeks between the first and second ratings. A correlation coefficient of .896 was obtained between the two sets of ratings. The final criterion consisted of the combined and averaged rating scale scores multiplied by ten to eliminate the decimal. The possible range of scores was 110-550. The actual range was 205-550, with a mean score of 445.250 and a standard deviation of 79.380.

VI. Qualitative and Quantitative Analysis

A. Qualitative Analysis:

The job analysis indicated that the following aptitudes measured by the GATB appear to be important for this occupation:

Numerical Aptitude (N) - required in calculating the bill and adding taxes as prescribed.

Manual Dexterity (M) - required in setting the table, serving and handling food and beverages, and cleaning eating and serving area.

On the basis of job analysis data, the following aptitudes are considered obviously unimportant for performing the duties of this job and are considered "irrelevant" aptitudes: Spatial Aptitude and Form Perception.

B. Quantitative Analysis:

Table III shows the means, standard deviations, and Pearson product-moment correlations with the criterion for the aptitudes of the GATB. The means and standard deviations of the aptitudes are comparable to general working population norms with a mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB

N = 60

Aptitudes	M	σ	r
G-Intelligence	94.2	16.6	.080
V-Verbal Aptitude	95.1	11.7	-.068
N-Numerical Aptitude	93.2	16.5	.268*
S-Spatial Aptitude	97.4	20.8	.047
P-Form Perception	99.2	20.6	.030
Q-Clerical Perception	102.5	15.0	.066
K-Motor Coordination	102.1	16.3	.028
F-Finger Dexterity	102.2	16.3	.198
M-Manual Dexterity	108.5	20.3	.178

**Significant at the .01 level
*Significant at the .05 level

Aptitudes M, Q, F and K have the highest mean scores and aptitude V has a relatively low standard deviation.

For a sample of 60 cases, correlations of .331 and .255 are significant at the .01 level and the .05 level of confidence, respectively. Aptitude N correlates significantly with the criterion at the .05 level.

C. Selection of Test Norms

TABLE IV

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important			X						X
Irrelevant				X	X				
Relatively High Mean						X	X	X	X
Relatively Low Sigma		X							
Significant Correlation with Criterion			X						
Aptitudes to be Considered for Trial Norms			N						M

Trial norms consisting of various combinations of Aptitudes N and M with appropriate cutting scores were evaluated against the criterion by means of the tetrachoric correlation technique. A comparison of the results showed that B-1002 norms consisting of N-85 and M-85 had the best selective efficiency.

VII. Concurrent Validity of Norms

The validity of the norms was determined by computing a tetrachoric correlation coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing as close as possible to one-third of the sample in the low criterion group. A criterion critical score of 405 was used and resulted in 20 of the workers, or 33 percent of the sample, being placed in the low criterion group.

Table V shows the relationship between test norms consisting of Aptitudes N and M with critical scores of 85 and 85 respectively, and the dichotomized criterion for Waitress 2-27.12. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE V

Validity of Test Norms for Waitress 2-27.12
(N-85 and M-85)

N = 60

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	6	34	40
Poor Workers	11	9	20
Total	17	43	60

$r_{tet} = .65$ $\quad X^2 = 8.629$

$\sigma_{r_{tet}} = .22$ $\quad P/2 < .005$

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes N and M with minimum scores of 85 and 85 respectively, have been established as B-1002 norms for the occupation of Waitress 2-27.12. The equivalent B-1001 norms consist of N-90 and M-90.

IX. Determination of Occupational Aptitude Pattern

A significant relationship between OAP-20 and the criterion for the experimental sample was obtained. The proportion of the sample screened out by OAP-20 was .20, which is within the required range of .10 to .60. Therefore, the occupation of Waitress 2-27.12 will be allocated to OAP-20.